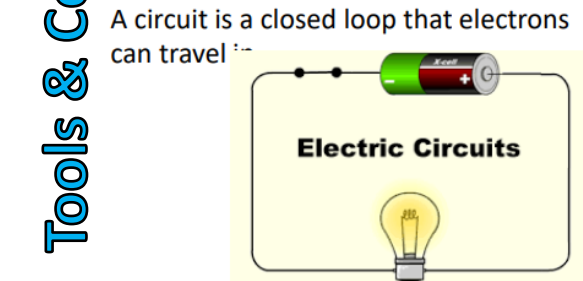
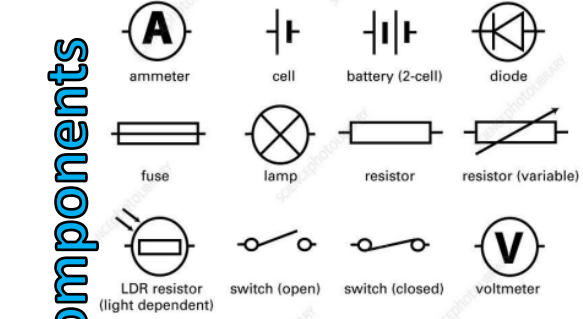




| The 6Rs | Meaning                                                                                                                                                                                                                                                                                                                                             |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reuse   | To use a product again either for the same purpose or a different one                                                                                                                                                                                                                                                                               |
| Reduce  | To have less of material/packaging/pollution when making products by making them more efficient                                                                                                                                                                                                                                                     |
| Recycle | Breaking down and forming the material into another product                                                                                                                                                                                                                                                                                         |
| Refuse  | Customers not buying or supporting products that make an environmental impact                                                                                                                                                                                                                                                                       |
| Rethink | Designers and customer rethinking their decisions when making and buying products.                                                                                                                                                                                                                                                                  |
| Repair  | Fixing a product rather than throwing it away. Extending its life rather than using more resources to make another<br><br>Often products are <b>Designed for Maintenance</b> so can easily be repaired. E.g. Using screws so even non-specialists can take a product apart, or using components that can easily be replaced like fuses or batteries |

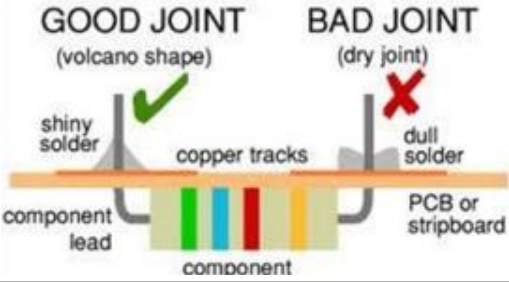


## Sustainable Lamp

**What is soldering?**

- Soldering is used in electronics to **join components on to a circuit board.**
- Soldering creates a **permanent joint** between two pieces of metal (an **electrical joint** and a **mechanical joint**).
- Heat is used to melt solder around a joint.
- Solder is usually made from tin and lead (metals) which is known as an alloy.

**How to solder**



**MOVEMENT**  
Mechanical device produce different types of **movement**.

| LINEAR                          | RECIPROCATING                              | OSCILLATING                              | ROTARY                                 |
|---------------------------------|--------------------------------------------|------------------------------------------|----------------------------------------|
|                                 |                                            |                                          |                                        |
| Movement along a straight line. | A repetitive back-and-forth linear action. | A repetitive motion along a curved path. | Moving in a circular motion on a axis. |

## LEVERS

Provide mechanical advantage (MA). They have two parts – a bar and a pivot (fulcrum). There are 3 classes of levers

|     | Description                                                                                                            | Diagram | examples                         |
|-----|------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------|
| 1st | The fulcrum is positioned between the load and effort. The effort is reduced by moving the fulcrum closer to the load. |         | Scissors, Seesaw, Crowbar.       |
| 2nd | The load is positioned between the fulcrum and the effort. Load is reduced by moving the load towards the fulcrum.     |         | Bottle opener, Wheel barrow.     |
| 3rd | The effort is positioned between the fulcrum and the load. The input effort is greater than the output force.          |         | Tweezers, Fishing rod Human arm, |

## LINKAGES

**Linkages** are mechanisms that use rigid parts to: Change the magnitude of a force, Change the direction of a force, or Transform it into a different motion.

|                                                                  |                                                                |
|------------------------------------------------------------------|----------------------------------------------------------------|
| Parallel Motion<br>                                              | Bell Crank Linkage<br>                                         |
| It keeps the direction of the output the same as the input.      | Input direction is converted through 90 degrees.               |
| Crank and Slider<br>                                             | Treadle Linkage<br>                                            |
| Converts rotary motion into reciprocating motion and vice versa. | Converts rotary motion into oscillating motion and vice versa. |

**Tools & Components**